UNIVERSITI TEKNOLOGI MARA (UiTM)

CYTOTOXIC EFFECT OF PACLITAXEL LOADED AND SURFACE COATED N-VINYL CAPROLACTAM

NORMAIZATUL SHAFIQAH BINTI ZAIROSLI

Dissertation submitted in partial fulfillment of the requirements for the PH 210 Bachelor of Pharmacy (Hons)

FACULTY OF PHARMACY

2013

ACKNOWLEDGEMENT

First and foremost, I would like to thank Allah S.W.T for giving me strength and guidance to complete this research. I would like to express my deepest appreciation to all individuals that involved and contributed in stimulating suggestions, ideas, encouragement, knowledge, effort and time through this learning process of this degree research.

I would like to express my gratitude to my research supervisor Dr. Vasudevan Mani who has supported me with his patient and knowledges. Thank you Dr. Vasudevan Mani for allowing me the room to work in my own way. Next, I would like to acknowledge with much appreciation to Dr. Lim Siong Meng for his help, advice and insightful comments. I also want to thank staffs of Collaborative Drug Discovery Research (CDDR) especially to Mr Zaki Ramli for spending his precious time to give help and guidance for my laboratory work and research.

Lastly, I have been blessed with friendly and cheerful group of lab partners for enlightening my research work. Lastly, a millions thank you to my family for their loving support and understanding towards me.

TABLE OF CONTENT

ABSTRACT

Paclitaxel alone has developed novel approach activity against breast cancer treatment. Highly effective antineoplastic activity of paclitaxel allows it to activate cell apoptosis and necrosis by stabilizing the formation of microtubules and thus prevent cell division. This study were intended to formulated new formulation which is a combination of Paclitaxel and N – Vinylcaprolactam (NVC) and compared the cytotoxic effects between Paclitaxel alone and new formulation of Paclitaxel and N – Vinyl Caprolactam against human breast cancer lines , MCF – 7. The method that had been conducted were Sulphorhodamine B assay (SRB assay) in order to determine cytotoxicity activity by evaluate the level of IC_{50}. Based on the result, for IC_{50} Paclitaxel was 6 µg/ml meanwhile IC_{50} for newly formulated Paclitaxel and N – Vinyl Caprolactam was 10.3 µg/ml. Interestingly, although IC_{50} for newly formulated Paclitaxel and N – Vinyl Caprolactam was slightly higher compared to IC_{50} of Paclitaxel but they do have significant roles in reducing percentages of cell viability.

CHAPTER 1

INTRODUCTION

Cancer is defined as diseases in which there are arising of abnormal cells dividing without control and has the ability to invade and destroy other surrounding tissues. Metastasis or also known as spread of cancer may occur via the blood and lymph system (National Cancer Institute, 2012). Cancer can be grouped into several categories which are carcinoma, lymphoma, leukemia, and sarcoma (Oxford Concise Medical Dictionary Fifth Edition, 109).

Cancer is the leading cause of death worldwide (WHO, 2008) and the third leading cause of death in Malaysia after heart disease & disease of pulmonary circulation followed by septicaemia (Zainal Ariffin and Nor Saleha, 2007). There were 7.6 million deaths worldwide (WHO, 2008) meanwhile in Malaysia, there were 11.28% of death reported due to cancer (Zainal Ariffin and Nor Saleha, 2007). Breast, lung, stomach, colorectal and prostate were the five leading global causes of cancer mortality (WHO, 2008).